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Accountable Management in the Department of Health and Social Security

R. S. MATTHEWS, CB, Department of Health and Social Security

Mr. Matthews is Deputy Secretary, Administration and Social Security Operations, DHSS. In the February edition we published an article by Mr. S. D. Walker which was a revised version of a paper circulated by CSD to those attending a Civil Service College seminar on accountable management; the May edition included an article by Mr. J. S. Cassels, Director, Manpower Services Commission, based on a paper he presented at the seminar. The following article by Mr. Matthews is based on a paper which he presented at the same seminar. — *Editor.*

Introduction

The Department has two main areas of responsibility: the Health and Personal Social Services; and Social Security. It is only in our social security work that we have developed accountable management in the sense that the term is used in the Civil Service, and then only in that part of the social security work which is primarily concerned with delivering benefits to claimants and in collecting contributions. The tasks that we have to perform in this area are to establish the correctness of contributions and maintain the personal accounts of contributors; and to administer the benefits, contributory and non-contributory, to standards of quality which are not always clearly defined, within the resources of manpower and money made available to us. We deliver over 30 distinct—but often interacting—cash benefits. In the last financial year some 20 million payments were made, on average, each week amounting to over £12 billion in benefit expenditure in a year; and £8,435 million was collected in contributions and there were 36 million 'postings' to 24 million accounts.

We have two large central offices at Newcastle and Blackpool, the Controllers of which are responsible to me. We have 540 local offices in 12 regions (including for this purpose Scotland and Wales as 'Regions'). The local office managers are responsible to Group Managers and they in turn to the Regional Controllers. The Controllers of the 12 Regions are responsible to the Director of the Regional Organization (DRO), who in turn is responsible to me. As the head of this organization I am responsible to the Second Permanent Secretary who has overall responsibility for social security work. Thus we

have at least one prerequisite of accountable management—everyone knows to whom he is responsible. In addition to being responsible for social security operations I am also the Principal Establishment Officer, and in this capacity I am responsible to the First Permanent Secretary who is the Accounting Officer for most of the Department's administrative vote which totals £550 million. Most of the Vote is, of course, spent on delivering social security benefits, and this work takes up 87,000 of the Department's 96,000 staff.

The management structure is headed by the Management Board, under the chairmanship of the Permanent Secretary and responsible for the overall management of the Department. Beneath the Board there are two strategy committees—for Health and Personal Social Services and for Social Security, the former chaired by the Permanent Secretary and the latter by the Second Permanent Secretary. Social Security operations are planned and co-ordinated by the Social Security Operations Management Team. This Team, under my chairmanship, consists of the Controllers of the two Central Offices, the Director of the Regional Organization, the two Establishment Under Secretaries and the head of our Management Support and Computers Division. The Deputy Secretary with responsibility for Social Security policy and the Finance Under Secretary concerned with the social security and administration votes usually attend the Team's meetings.

An organization chart is at *Figure 1*.

Overall planning

Planning within the accountable management group starts with an annual plan, so that the head of each unit knows at the beginning of each financial year:

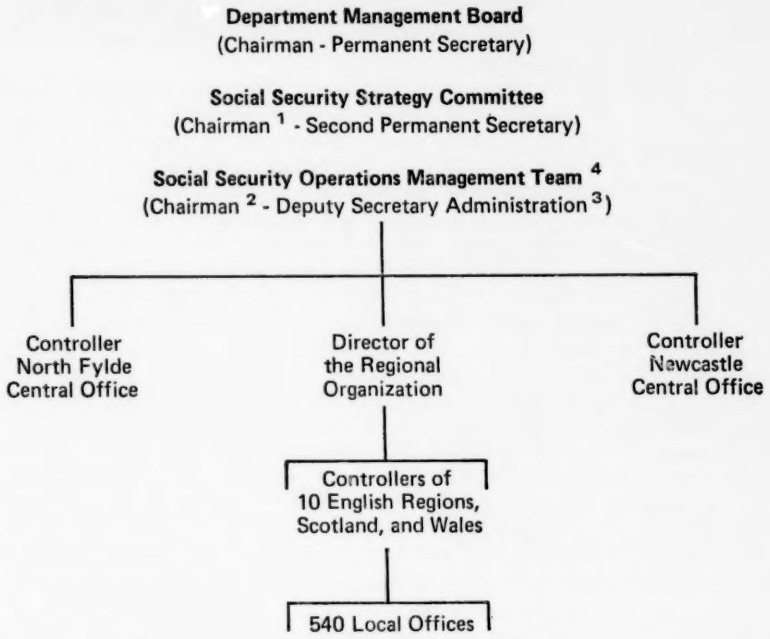
(*a*) The main tasks to be performed; new benefits, possible increases in benefit rates, etc (so far as can be foreseen).
(*b*) The forecasts of the quantity of work that will accrue in the year.
(*c*) The manpower available. (It is the responsibility of the head of each unit to do the work within the resources available to him.)

Unit heads and I are provided with a monthly manpower statement together with a profile of the expected rate of expenditure by comparison with the annual provision. It is the responsibility of the head of the unit to stay within the approved manpower budget, to take what corrective action is necessary if he is in danger of exceeding it and to alert higher management if, as not infrequently happens in a Civil Service context, the operational assumptions used at the beginning of a year are subsequently upset.

Management styles

Each of the three units which accounts directly to me has a different style of management because their circumstances and histories are different. The two central offices operate on the basis of an annual plan against which there is a continuous review of achievement. Actual

Figure 1. **DHSS - Social Security Operations**


Department Management Board
(Chairman - Permanent Secretary)
Social Security Strategy Committee
(Chairman 1 - Second Permanent Secretary)
Social Security Operations Management Team 4
(Chairman 2 - Deputy Secretary Administration 3)
Controller North Fylde Central Office
Director of the Regional Organization
Controller Newcastle Central Office
Controllers of 10 English Regions, Scotland, and Wales
540 Local Offices

1. Member of Department Management Board
2. Member of Department Management Board and SS Strategy Committee
3. Deputy Secretary Administration is also the Principal Establishment Officer
4. Management Team also includes the two Establishment Under Secretaries and the head of Management Support and Computers Division

performance is maintained by exception reporting at each successive level of management. Much detailed information is collected weekly about the receipt and clearance of work (increasingly as an integral part of computer processes) and the findings of a continuous audit of the work are available. Based on this information a system of exception reporting—largely oral (but backed with documents where necessary)—has been developed. This is achieved through a process beginning with the EO manager and his staff and ending in the weekly meetings of the top management of each office where the functioning of the whole office is surveyed. There is a clear requirement at each level to report upwards any deviations from planned performance which cannot quickly be rectified with the command's available resources. Control of forward planning and the establishment of new projects are achieved through steering committees and working groups. In the Regional

Organization a system based on 'Management by Objectives' has been developed.* This was introduced following publication of the Fulton Report and a subsequent Management Services study which identified areas in DHSS where MbO might be applied. I shall now describe the system's main features.

Our regional organization uses some 75 per cent of the Department's manpower—70,000 staff—and comprises 540 local offices, organized in 45 groups each under a Group Manager, 12 regions each under a Regional Controller and a Headquarters Regional Directorate headed by an Under Secretary—the Regional Director. It covers the whole of Great Britain. The current style of management has developed around a system based on MbO, which we refer to as 'participative accountable management'. Introduced initially into pilot regions in April 1970, the system was thoroughly reviewed in 1976. It is still developing with further improvement planned. Essentially, we have converted MbO into a system to involve staff to the maximum extent possible. It is our aim to involve all members of staff as far as possible in the decisions which can be taken in the local office itself that affect what they do and how and when they do it. This is an essential part of the management style of the regional organization. Staff participation, of course, does not detract in any way from a manager's accountability for resources used and results achieved. Let us now look at two of the pillars of participative accountable management—the annual review process, including performance reviews and the management information system, including performance indicators.

Regional planning

There is no single document or plan detailing the use of the regional organization's resources but an annual review process, whereby plans are constructed and agreed at the various management levels. There is a planning cycle, the first step of which is for the Director to seek the views of all parts of the Department and of the staff—about which areas of the work merit most attention—the priority areas—in the coming year. At the same time he is informed of any inescapable additional tasks which have to be accommodated. In the light of this information he prepares, in consultation with the Departmental Staff Side, a list of departmental priority areas which indicates the areas of work on which management should concentrate. This list is issued to Regional Controllers each of whom decides, in consultation with the Regional Staff Side, in which priority areas his Region can make a contribution and also whether there is such a pressing need for action in some aspect of work in his Region that this must displace even a departmental priority. A similar process goes on right down the management line until EOs

* *See* 'MbO in the Regional Organization of DHSS' by R. Walton. *MSIG*, Volume 30, Number 2, May 1975.

and their sections have decided what are to be their priorities for the coming year. Before the beginning of the financial year the Director and the Controllers also know what manpower they have been allocated. The allocation is based on the forecast workload.

Performance reviews

Achievement against target is measured by means of performance reviews which take place between February and April and between August and October. These reviews take the form of meetings between a manager and his senior officer to review results and plan for the future, including identifying target levels of performance and priorities. They take place at all managerial levels, starting with EOs, right up to Deputy Secretary and culminate in a yearly review of each region's performance conducted by the Director and the responsible Regional Controller, and finally a meeting between the Director and myself to review the national position.

Information on performance is provided through a Management Information System (MIS), a statistical information system and audit and surveys of local offices. It is on the basis of this and of information from other sources that fresh plans are prepared, priorities reconfirmed or adjusted and, where necessary, corrective action initiated. At present the MIS monitors the performance of local offices in their main areas of work at regular four-week intervals and gives details of workloads and manpower utilization. The central core of the system is 16 standard and mandatory performance indicators of which three measure accuracy and the rest measure the amount of work done and speed of output relative to target levels of performance. An interesting feature of the system is that the standard of performance which is set for each local office in relation to each performance indicator is first established by the local office manager and his staff and then agreed by the Group Manager. The level of performance desired may therefore vary from one local office to another. Output data are sent by local offices to Regional Offices where the figures are aggregated to produce group and regional summaries. These go on to a central data unit where a national picture of performance in the Regional Organization emerges.

Overall effect

How has all this affected our management of the work? We undoubtedly have a much better flow of distilled management information to the top of the office than we had before and this improves our ability to meet the needs of both internal and external accountability. Our responses are therefore better informed than they were and we now have a systematic and cohesive approach to the determination of priorities and standards. The information is also of value to middle management; for example, the review of the system in 1976 showed that 50 per cent of managers used the performance indicators in the deployment of their staff, 52 per cent in managing their own work, 87 per cent in

identifying the need for remedial action and 76 per cent in setting and monitoring objectives. This represents an improvement for a system of management which was, historically, centralized, authoritarian and rigid. But there are some deficiencies: we lack adequate measures of quality—speed and turnover are not difficult to measure but quality of service is more intangible. We expect to make progress in this area soon. A statistically sound system of measuring accuracy of payment has been lacking. One has recently been introduced and will eventually be used by the PFO as well as by management. The MIS should cater better for the needs of policy groups and resource controllers in Headquarters—this is being explored, but we want to avoid a complicated and expensive system. The greatest deficiency of all though is that the MIS is disliked by so many staff. The review in 1976 showed that, while staff accepted the need for control information on performance, output, etc, they felt strongly that the MIS had been devised with the interest of the heads of the Office in mind and that it did not meet local needs sufficiently. They felt that the performance indicators and rating scales used were suspect, and feared that management would use the results to put pressure on individuals to get more work out of them. There is a real problem here which arises because, in a standardized system in which all information has to be collated and fed up the line, the choice of performance indicators is obviously limited. There could be no useful collation if all offices were allowed to make their own choice. As a consequence the existing performance indicators have been evolved by discussion with managers and Staff Side at all levels with the final stamp of approval being given by a Whitley Committee. Inevitably this has resulted in a degree of compromise. Each mandatory performance indicator is welcomed, tolerated and condemned at the same time by different managers with different problems and different views on what can most usefully be measured. At the same time Staff Side opposition prevents managers getting agreement to add other indicators which they would like. We are reviewing management information needs at local, regional and headquarter levels in order to try to crack this problem and proposals have been put to our Departmental Staff Side. The aim is to limit the requirements for information at the top to aggregations of information required at lower levels. I think I would sum up our experience by saying that, although a MIS is a lynch pin of accountable management, it is one of the most difficult parts of the system to get right, because of the varying needs of different levels of management and Staff Side pressures.

Effect on staff

Accountable management has become inseparably linked with the particular form of participative management that we have introduced. Where has the tremendous investment which we have put in it got us? It cost £1·5 million to introduce and we are maintaining management

development advisers at £0·25 million a year. Was it, is it, worth it? The review two years ago gave a mixed picture. The top level of management (Regional Directorate) considered that a number of beneficial changes had taken place in the areas of organization, participation and involvement, and accountability for performance levels. The regional level of management was less positive but thought there was a greater awareness of responsibilities, standards of performance and the use of management control information. The office managers —and 500 completed a questionnaire—by a slight majority thought that participative accountable management had made little or no difference to the effectiveness of their offices. On the other hand, bearing in mind that we were and are aiming to change long-held and often deeply entrenched attitudes and practices, one could derive encouragement from the fact that almost a half thought that effectiveness of their offices *had* improved as a result of participative accountable management. I take a generally optimistic view. Our regional organization has settled into a pattern of formulating objectives, and using objectives to improve performance. Although there is a certain reluctance to accept that there has been a benefit I believe that managerial effectiveness has improved, although I can produce no objective evidence of this. The aim of involving staff as far as possible in all decisions which can be taken at local office level which affect what they do and how and when they do it is more successful than some unions want to accept. Some aspects of the system are warmly supported by staff, for example, a significant majority of those completing questionnaires favoured performance reviews. But if managerial effectiveness and perhaps staff involvement register plus signs, the effect on the motivation of the mass of the staff may be at best neutral. I do not mean by this that our staff are not well motivated; many are, but perhaps more by their awareness of the importance of their work to the customer than by the influence of the management system. There can be no doubt that the development of first MbO and now participative accountable management was accompanied by a barrage of criticism from the unions. Their objections are based mainly on the belief that participative accountable management is an attempt by management to get staff to work harder without reward, that levels of performance would be raised and the amount of work increased. They also see direct staff participation with management as undermining their authority to represent members. They criticize the failure of some managers to adopt a participative style, lack of time for the proper implementation of participative processes, and insufficient training provided for staff. Our mistakes were well summarized by our Regional Directorate at the time of the review. These were:

(*a*) The initial training of managers and staff in the use of the system was inadequate and patchy—we tried to do it too cheaply.
(*b*) Accountability was highlighted at the expense of participation.

(*c*) Management guides describing the system were too standardized and often imposed on staff.
(*d*) Action plans were often prepared in respect of minor matters in order to record a 'score'.
(*e*) Control information was seen by some people as extra statistics without real purpose.
(*f*) Standards of performance, although agreed with senior staff, were not always discussed sufficiently with the staff concerned.
(*g*) Performance reviews were sometimes no more than reviews of figures, not all senior managers operated the system with the sensitivity and penetration it requires.

Naturally, remedial action is being taken and we are still trying to achieve the junior staff commitment, which might, with more investment, have been secured at the outset.

General conclusions

The touchstone for success or failure must, of course, be our operational efficiency and I have said frankly that we simply cannot prove whether this has benefited as a result of the development of our management systems. I believe that it has but there are too many major influences at work—the vast increase in the number of claimants, the increased complexity of benefits, the difference in the social environment and in the attitudes of staff, etc—for us to be able to distinguish cause and effect. At the very least we can say that our managerial systems, and the managers, appear to be robust enough to withstand the pressures, which are increasing both in scale and variety. But the effort which we in DHSS have put into developing management systems for internal accountability may have been at the expense of other equally important and pressing management issues. However, we now have a system of accountable management which has been absorbed into the Department's life and we shall carry on refining and improving it. I think our 'managerial revolution' is over and we now need to consolidate what we have and to seek further improvement. For example, we are now putting more emphasis on the following, all of which can have important effects on managerial effectiveness:

(*a*) My ability to account better for the performance of the whole system—the Regions and Central Office, in particular those areas where the three commands are interdependent in providing a service to the customer.
(*b*) The closer involvement of the policy divisions in the setting of standards of executive performance and the identification of priority areas.
(*c*) The development of informative costings/management accounting systems.
(*d*) The selection, development and training of managers.
(*e*) The wider use of computers to help the local office staff.

I might perhaps end by saying that I am optimistic about the future: the 'patient' has had a difficult time but is still vigorous and improving.

21 Years of Transport Economy in Government

A. R. WILLIAMS, Civil Service Department

The Transport Economy Unit of the Civil Service Department celebrates its 'coming of age' this year. It was set up in 1958 as part of the Treasury O and M (General) Division and was transferred to the Management Services Group of CSD when the department was established in 1968.

Originally the Unit was set up to study ways in which economies could be achieved in the transport of government freight. Necessarily in its early years the Unit's small two-man team concentrated its efforts on rail transport but since then there has been a steady move away from rail towards road transport and the nature of the Unit's work has changed accordingly. It is now concerned primarily with the various aspects of road transport and provides a general advisory service to government departments on the operation of their vehicle fleets. It also undertakes studies at the invitation of individual departments and examines aspects of transport of common interest to all government vehicle fleets which now total some 23,000 vehicles (excluding vehicles of the Armed Services) ranging from 'Minis' to large commercial vehicles. Since 1958 the work of the Unit has led to total immediate savings approaching £15 million. This figure does not include the continuing savings arising, for example, from the negotiation in earlier years of lower national rail freight charges, or the reduced and continuing annual operating costs of smaller vehicles (see below).

In the early 1970s the work was given an added impetus by the ever-rising costs of transport and, in particular, the fuel crisis of 1974. Since then, in addition to maintaining its general advisory role, the Unit has been concentrating its efforts on ways of improving the general management of vehicles and examining the extent to which new lower vehicle standards might be applied throughout government. In pursuance of this aim two major interdepartmental studies of 'Passenger and Dual Purpose Vehicles' and 'Despatch and Delivery Van Services' have been successfully completed. The studies involved the examination of the use of a total of about 7,000 vehicles dispersed throughout the United Kingdom and in both cases the review team was guided in its work by an interdepartmental Steering Committee drawn from major vehicle operators in government.

On vehicle management both studies produced a number of recommendations aimed at improving local and central control and covered

aspects such as organization, the development of improved costing and information systems, vehicle maintenance and servicing procedures and vehicle usage. Potential annual savings arising from these proposals are estimated to total about £900,000.

In particular the use of effective information systems was seen as crucial to the maintenance of efficient management. Whereas a simple clerical documentation system may provide a satisfactory control for a manager with responsibility for only a few vehicles, a more sophisticated approach is necessary for the efficient control of larger fleets. One major fleet operating department has already successfully introduced a computerized records and costing system and the Unit is currently examining with departments how far the use of such systems might be extended with profit to other fleets.

The experience gained in these reviews together with the earlier work of the Unit has been brought together in a Transport Management Handbook first published in 1975.* Because of the local nature of much government work departmental vehicles tend to be widely dispersed and the handbook is aimed at those managers who are not trained as major fleet operators and for whom transport is a minor part of their total area of responsibility. One, now more than ever topical, section of the handbook gives some hints and tips on ways of achieving fuel economy in the transport field. It was reproduced in the November 1975 edition of this journal, but is thought well worth repeating and is included as an annex to this article.

On passenger cars the Unit has had considerable success in guiding departments on the introduction of the new lower standards recommended in the report on 'Passenger and Dual Purpose Vehicles'. The new standards apply to official self-drive cars, which form the bulk of the government fleet and also to the small fleet of chauffeur-driven cars of the Government Car Service (operated by the Property Services Agency of the Department of the Environment) provided for the use of Ministers and senior officials. The standards cover a range of usage (e.g. for self-drive cars the basic standard is for vehicles with an engine capacity of 1000 cc or less) and by reducing both the numbers and the size of cars used are aimed at achieving economies in capital expenditure, fuel consumption and other operating costs.

At 31st March 1979 after the first full year's operation of the new lower standards capital expenditure had been reduced by £408,000. A similar level of saving is anticipated for several years as existing vehicles become due for replacement and further savings will accrue from reduced running costs. It is interesting that these savings are being

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* *Transport Management.* Published by the Civil Service Department in the General Service Forms series (E.133). Departments may obtain copies from HMSO. Persons and organizations outside the Service may purchase copies from The Librarian, Central Management Library, Civil Service Department, Whitehall, London SW1A 2AZ, price 60p, including postage (cash with order please).

achieved against a background of the opposite trend in the country as a whole, where recent EEC figures indicate that in the last few years car purchasers have moved towards larger and more expensive vehicles.

One of the main lessons learned from these major interdepartmental studies and from the earlier work of the Unit has been that while transport is an important common service it calls for constant examination and reappraisal as costs and methods change. Although guidelines have been agreed for the immediate future of vehicle fleet management, much remains to be done if we are to continue to obtain value for money from the considerable capital investment involved. As in other areas changes in society will have to be catered for in transport operations. Not least of these changes is likely to be the diminishing availability of fuel and the introduction of new technology so that, for instance, it is possible that within the Unit's next 21 years the transport of people and paper for business purposes may not be necessary on the present scale as the potentials for improved communication by use of remote meeting facilities and fast data transfer, etc, are developed using new technologies such as the microprocessor.

Annex

Some hints and tips on fuel economy

Fuel costs form a substantial part of the running costs of any vehicle. Recent developments have served to emphasize the importance of exercising all possible economy in the use of fuels. This is something to which all staff in the transport field can contribute and some of the ways in which they can do so are indicated below.

Transport managers and support staff

The effective organization and control of vehicles is as important as the way in which the vehicles are driven. Transport managers and staff should:

- plan and co-ordinate journeys to ensure as far as possible that vehicles have full loads (i.e. passengers and freight) and that drivers can go from one job to another covering minimum mileage
- instruct drivers to telephone base on arrival at destination if no return job has already been planned; urgent jobs or suitable pick-ups may have arisen since their departure
- ensure that sufficient time is allowed on journeys to avoid excessive speeds
- use vehicles best suited for the job in hand (e.g. the smallest suitable vehicle)
- choose road routes carefully (e.g. to avoid city traffic hold-ups)
- reduce air drag on vehicles by careful loading on load-carrying vehicles (e.g. large items first and smaller items at the front and on top)
- remove roofracks when not in use (tests have shown that empty roofracks can increase fuel consumption by as much as 5 per cent)

- use public transport for passengers where appropriate (this should always be considered as an alternative both to official vehicles and to the use of private cars on official business)
- for freight carrying consider the use of public road hauliers who may have spare capacity available, as an alternative to the use of official vehicles.

Drivers

The way in which a vehicle is driven has a direct effect on fuel consumption—fast driving is not compatible with economy. For example, a typical 2000 cc vehicle operating at constant speed shows deterioration in consumption as follows: 30 mph — 38 miles per gallon; 40 mph — 37 miles per gallon; 70 mph — 25 miles per gallon. Furthermore, rapid acceleration from a standing start will give only 9 miles per gallon for the first quarter-mile and 11 miles per gallon for the first half-mile.

Some general points for drivers to watch include:

- use the gears to get the best out of the engine; do not 'rev' the engine unnecessarily; anticipate changes in gear; do not race up to traffic lights or stop signs and brake sharply
- every use of the brakes is a waste of energy (i.e. fuel)
- automatic gears are generally less economic than manual gears; the less pressure on the accelerator the lower the speed at which the gear will change; particularly when starting 'kick down' on the accelerator will increase fuel consumption
- with synchromesh gear boxes it is not necessary to double-declutch and accelerate the engine to match the road speed (it wastes fuel)
- using the engine to brake wastes fuel
- avoid spillage when filling fuel tanks; check immediately any suspected fuel leakage from any source on the vehicle and arrange for necessary repairs
- switch off the engine if any undue waiting period is foreseen
- when switching off either for a short period or overnight it will not lead to easier starting if the engine is 'revved to leave the carburettor full'
- always ensure the correct grade of fuel is used
- tyre pressures below recommended pressures increase fuel consumption so check regularly that pressures are maintained to manufacturers' recommended levels
- use correct lubricating oils in accordance with manufacturers' recommendations
- never use fuel as a cleaning aid
- check rate of fuel consumption regularly and if excessive report to Transport Office
- ignition and carburettor (mixture) settings and jets should be in accordance with the manufacturers' specifications
- ensure that sparking plugs are always clean and have the recommended gap setting.

Job Satisfaction at DVLC Swansea

Miss M. WOOD, Civil Service Department

Introduction

This is the first of three articles describing the development of an approach to new ways of understanding, implementing and evaluating change processes in a large computer-centred organization. It must be said at the outset that the title 'Job Satisfaction' under which these studies have been carried out is not an adequate title but so far a more descriptive one has eluded us. The studies which will be described have involved some work re-structuring; but they have also concerned themselves with supervisory and management roles, with the organization of work and work procedures and a whole range of issues to do with the effective co-operation of people at all levels and in different parts of the organization.

DVLC

Most people's image of the Centre is of a large organization performing two basically simple tasks—the issue of driving licences and vehicle licences; after all, most people have experienced vehicle transactions for themselves across a Local Vehicle Licensing Office or Post Office counter—a simple operation taking a few minutes. Not surprisingly then, a delay of some weeks in issue from the Centre seems indefensible when viewed from an individual's perception of the task involved. But this perception needs to be set against the work of the Centre. Firstly, there is the problem of scale: there are about 6 million driver applications a year, a further 3 million pieces of mail concerned with driver applications, 10 million vehicle registrations, 29 million vehicle licences and another 9 million vehicle transactions. Secondly, something like 10 per cent of all transactions handled at the Centre require special treatment—dealing with a foreign language, medical cases, legal cases, etc, all of which need to be dealt with separately at some stage—and a further 7 per cent have to be returned to the public because of uncompleted forms, etc—and 17 per cent of 57 million transactions means nearly 10 million exceptions to the simple task. So the model is not a simple one, the task in totality is not simple and the organization and work procedures are not simple; and when all this is grafted on to a new computer-based technology the Centre can be viewed as anything but a simple organization.

By late 1975 most of the more difficult problems in setting up the new system had been solved or their solutions could be seen. At that

time, the management team at DVLC thought there might be a period of comparative stability not far ahead and began to be concerned about how they could continue to keep up the job interest and variety that had been present during the more difficult times now behind them. How could they build into that more stable organization the seeds of continuing interest and development? They sought the help of the Civil Service Department's Job Satisfaction Team.

The experimental approach

After detailed discussions with people in key positions in both management and unions, it was suggested that an experimental approach should be adopted in one part of the organization to see if methods could be evolved to point the way to a wider approach and that the experiment should be steered by a joint group of management and unions. The basic model of the approach was that developed by the Job Satisfaction Team in its work in the Department of Health and Social Security.*

The process starts with individual discussions with each member of the staff in the area concerned—discussions which are the essential building bricks of the whole process. There are two important reasons for this: the discussion provides information on areas of concern as well as job content, organization, etc; it also gives people hope—hope that there really are possibilities for tackling many of the issues that concern them. It is this latter area—hope that change is really possible —which provides the energy and enthusiasm for the change process; a particular facet of our approach that we now regard as vital to sustained development.

An example of the approach

The first area in which this approach was tried deals with inquiries from the public about vehicle licensing and registration. It has telephone and correspondence sections. The initial plan was to interview all members of staff individually. After about half the staff had been seen the Team felt that with the annual leave season upon everyone, the completion of the interview schedule might mean the loss of momentum to the project. We also felt there was sufficient information to feed back to the staff and so start the experimental change process. The intention was to see the remaining staff later but this never happened and staff not interviewed felt 'left out'. This feeling (expressed quite strongly by some staff at a later stage) helped the Team better to understand the importance of the individual interview and how vital it is in providing the energy for change.

During the interviews with staff about eight main themes kept recurring. It was these themes that the Team drew out of all the information received and fed back to the management team of the area. Managers

See '"New Model Office" Project in the Department of Health and Social Security' by D. Burden. *MSIG*, Volume 31, Number 1, February 1976.

and Team spent a whole day on the feedback session and after exhaustive discussion five topics were selected; one each by the five Higher Executive Officers (HEOs) as subjects for study undertaken by small working groups of all grades. The subjects selected were: (*a*) job training; (*b*) the duties of telephone clerks; (*c*) casework done in the Branch; (*d*) interface between the telephone and correspondence sections; and (*e*) interfaces with other Branches in DVLC. A sixth—the desirability of regular Executive Officer (EO) meetings in the Branch—was added later when the casework study group completed its task.

The study groups

Each HEO was given a completely free hand in how he set up his study group, the number of meetings held and the time devoted to the study. The only requirement was that regular communication about the work being done should be given to the Branch and senior management, the joint steering group, staff and the Team. Each study group did operate differently, developed at a different pace and completed their tasks at different times. One group, for example, was presented with a paper by the HEO which identified the problem as he saw it and provided the solution. It was useful as a base from which to develop but only after the study group determined that they all had an equal part to play in defining the problem and that there would probably be several ways of solving the problem which would need careful examination before seeking the views of the whole Branch. Another of the HEOs wanted to give all grades the immediate chance of chairing their study group meetings but found that such an abrupt change helped very few people in the group. By allowing this change to develop in stages he and the group were eventually able to hold meetings in which almost any of them could chair and run the meeting successfully. All the groups kept minutes of their meetings and these were used as the major communication channel, informing people how the various studies were progressing. The Team discovered later that written communication did not make people feel as involved as verbal communication and, naturally enough, those in the study groups felt more involved and committed to the changes than some of the other members of the Branch.

The role of the Team members changed at this stage of the experiment. At the beginning they had been collectors and disseminators of information from and to the Branch; now they helped the Branch in initiating and implementing change. The method of helping at this stage was to act as observers at the various study group meetings, to comment on the process of them and occasionally to get involved in the content of the discussion. The whole purpose was to enable staff and managers to challenge and test out their own ideas on what might be changed. As one of the Team members was an HEO from DVLC, his knowledge of the organization, system and people within it was invaluable when considering with the Branch how to implement their

ideas. When other Branches needed to be consulted or their closer involvement was required, the Team acted as third party in getting people together and in creating a better climate for mutual concerns to be discussed.

Team members also acted as advisers to individuals in the way they could be more helpful members of the groups whether they were managers or clerks. The Team also helped in the understanding of the development of a more open and participative style of managing people and the work that had to be done. The main information link between the Branch, unions and the DVLC Joint Steering Group was also provided by the Team. From time to time the Team acted as 'regulators' to the development of change; intervening when change was too rapid for all staff to come to terms with and providing the impetus when apparently progress was going too slowly for the Branch.

Results of the study groups

All five groups achieved their objectives wholly or in part. The most immediately successful was the setting up of a Training Team within the Branch. This study group, after consulting with the whole Branch and other training areas in DVLC, recommended that staff from the Branch with experience of the job should train all staff of the Branch but the style and content of the courses were left to the Training Team to decide and modify according to the staff's needs. A refresher course, building upon the experience even the newest staff members had gained, was the basic training module. It proved invaluable when the workload of the Branch increased by some 30 per cent—staff and managers were better trained and qualified to handle inquiries from the public. The view of the Head of Branch at that time was that the Training Team had helped the Branch through a really difficult work period and had a real effect on the increased efficiency of the Branch.

The duties of telephone clerks at the beginning of the study were to answer telephone inquiries but those that required further action were passed on to the correspondence section. The telephone clerks wanted a job that would enable them to follow up cases and both the telephone and correspondence sections felt that because of the restricted nature of the telephone clerks jobs a 'them' and 'us' situation existed. The study groups looking at the duties of the telephone clerks and the interface problems between the two sections had a difficult task—how could busy telephone clerks handle other duties and how could the barriers between the two sections be lifted? The groups themselves were made up of representatives from both areas (although not to begin with, and this initially created difficulties until representation across the whole Branch was achieved).

In discussing the ways in which the telephone clerks' jobs could be improved several misunderstandings between the two sections were removed—staff had been given the chance to discuss mutual problems and the opportunity to help solve them. A pilot scheme whereby tele-

phone clerks handled certain of their cases was introduced by the staff with the help of the Team. This scheme was undertaken by a small group of staff to test its viability for the whole section while the remainder of the section continued with their normal work. When the study group and those involved in the pilot scheme were happy with the way things were progressing, they reported back to all the staff and it was agreed to adopt the new way of handling telephone inquiries throughout the whole section. During this time, of course, the correspondence and telephone sections had moved closer together in understanding each other's work and the interface between the two became less tense.

The Branch is concerned primarily with casework arising from inquiries, and it wanted to perform its task as effectively as possible. The study group reviewed the casework undertaken in the Branch, and with representatives from other Branches agreed upon the most effective way of handling the cases. This lead to the movement of blocks of work from the Inquiry Branch to other Branches and vice versa. It meant that inquiries were routed to the right place for an answer and a speedier response to the satisfaction of the inquirer and the staff.

The study group examining the interfaces between its own and other Branches had, in retrospect, probably the most difficult task to handle. It was not totally successful—representatives from other Branches were not sure what was expected of them, the overall objective was not clearly defined, the meetings became too large and the junior staff felt that the meetings were biased towards HEOs' concerns and policy matters. However, two major successes did emerge from this original study. Firstly, programmes of visits by clerical staff in the Branch to other areas closely connected with the Vehicle system were arranged so that they could become acquainted with the whole Vehicle system and learn more about their counterparts' jobs. Secondly, the lack of communication at clerical level which was highlighted in this study led, later on, to Clerical Officer/Clerical Assistant meetings which were able to feed in their ideas and views to the EO meetings which were established as a result of the sixth study mentioned earlier.

The end of the experiment?

Once the tasks of the study groups had been completed the groups themselves were wound up and in one sense the experiment had come to an end. The experimental approach had not, however, as the Branch had learned that it could handle change, that it was possible to test out potential solutions, modify them and adopt those changes most suitable for the Branch. Having learned that this approach worked, the Branch has continued to develop in this way.

This development has not been easy; and in the second article in this series the continuation and its associated difficulties and successes will be discussed. The start of another study in a clerical processing Branch in DVLC will also be described.

Computer Work Revisited

D. W. CROISDALE, Civil Service Department

Derrick Croisdale is Deputy Director Systems Training at the Civil Service College. In the article that follows he expresses some personal views. —*Editor.*

Out of necessity!

Lord Peart, the then Lord Privy Seal, speaking at the British Computer Society 79 Conference in January 1979, referred to the impact of advancing computer technology. He said that it seemed likely to require a reappraisal of the traditional roles of computer specialists, management services practitioners and line managers. The implication was that there may be a re-distribution of roles resulting in computer specialists losing some of their former roles to the others. Should the role transfer merely pass through management services people, like a shock wave creating no lasting change, or should some of it be absorbed by management services? This survey will argue that systems analysis is a proper function of O and M practitioners and by no means the preserve only, or mainly, of computer specialists. Indeed, a properly qualified experienced computer specialist—of the type described in this article—is unlikely to have the qualifications, experience or personal qualities appropriate for a business systems analyst.

Computer specialists in the Civil Service are well entrenched in their 'functional specialism'—and may become more firmly entrenched if they ever become an 'occupational group'.* By contrast most O and M practitioners in management services units are not regarded as specialists, let alone professionals, which jeopardizes their chances of assuming responsibility for systems analysis as one of their proper roles. If it were to be decided that management services units should assume this new role then the staffing of such units and the training, education and career development of its practitioners would have to undergo substantial change. The present arrangements, if continued, would ensure that O and M work would become increasingly isolated from the bulk of the systems analysis work likely to be undertaken in the future in connection with computer-assisted administrative systems. They would become handmaidens to computer people—left to clear

**Longer-term Review of Administrative Computing in Central Government*, CSD, April 1978, paragraph 95: 'We cannot therefore exclude the possibility that at some stage in the future, despite the managerial and other disadvantages of such restructuring, highly technical staff (or possibly a wider group embracing some or all of those who at present form the functional specialism within the Administration Group) may have to form a separate occupational category. . . .'

up the messy little pockets of trouble in the wake of systems developments. Is this to be their future role? I hope not, because computer specialists are not likely to be the appropriate people to be entrusted with total systems analysis and design.

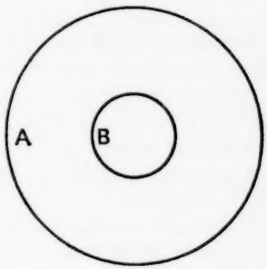
Let it not be thought that I am in any way belittling computer work. Quite the contrary! I think computer system design and production—that is designing and creating combinations of hardware and software—and the operation of computer facilities to be highly specialized, professional jobs for which talented people are needed. What I am saying is that it is difficult to see how more than a minority of those same specialists could also become systems analysts concerned with the totality of administrative systems analysis.

In this article an attempt is made to define roles and relationships for all those people involved with computerized systems. It concludes that some changes in the traditional roles of computer people, O and M practitioners and end-users are necessary: the role of the systems analyst is a vital one.

Are systems computer-assisted or computer-dominated?

Of crucial importance to the effectiveness and efficiency of a system are the definitions of the relationships which exist between the interdependent activities. Without such definitions anarchy and chaos may reign. A good system is an *orderly* arrangement of interdependent activities and related procedures which implements and facilitates the performance of a major activity of an organization. It is commonly accepted that related activities can be grouped into sub-systems—but it is then necessary to define the relationships between sub-systems.

The author subscribes to the view that all computer-assisted systems can be *conceptualized* simply as two concentric circles:



A may be regarded as the boundary of a *total administrative system* (within an organizational boundary) and B as the boundary of the *computer system* which assists in meeting the operational requirements of the total system. The total system may best be described as the host system; the description emphasizes the relationship which should exist between a computer system and its environment. Invariably a computer system

is a subordinate part of the total system. And the host system should define the operational characteristics of a computer system, not vice versa.

The computer system may be described as the combination of hardware and software associated with a processor or group of processors—plus the people needed to design, develop, implement and operate *such combinations of hardware and software* (and nothing else!). A computer system may be anything from a micro-computer-driven office machine to a network of main-frame computers.

The host system may be described as the combination of people and off-line equipment forming the total operational environment of the computer system. It inputs data to the computer system, it acts upon information received from the computer system but, most important, the host system is responsible for the management of the total system—its effectiveness, its efficiency, its security, its capacity to maintain and extend itself.

The host system is purpose-oriented whereas the computer system is but one means of achieving the operational requirements defined for it by the host system. This model of the relationship between the two systems also reinforces the view that the roles of computer system people are subordinate to the roles of those in the host system. In other words, systems should be computer-assisted and not computer-dominated! How to ensure that this is achieved is considered in the remainder of this article.

'I am in good spirits, for I hope another year will really make me something of an analyst'

So said Lady Lovelace when writing to Charles Babbage in 1843. She is often mistakenly regarded as the world's first programmer—which does her less than justice. She was a mathematician helping another mathematician to solve the problem of accurately producing astronomical, nautical and mathematical tables. It was through *analysis* that she was able to define how the difference engine would assist in solving the problems. It was only incidental that Lady Lovelace became a programmer—there was no one else to do the job! What mattered was the quality of her analytical ability applied to problems she knew well. Today we have programmers aspiring to become analysts yet knowing next to nothing about the problems they would have to analyse. On the other hand why, apparently, do so few people with experience of the day-to-day management problems—the so-called 'users' in the host system—become analysts? Maybe many do aspire but are simply not selected for one reason or another. More important, perhaps, the bias in most education and training schemes seems to support the continued domination of computer-system people, as if they were the people chosen by destiny to design systems *for* users. This is largely a result of an historical accident in that until the late 1960s the majority of computer-system people were ex-users and it seemed natural for specially

selected users to design systems for their erstwhile working colleagues. But the distribution of manpower has changed over the years and very soon the majority of computer-system people will be those who have spent their whole working lives in computer work and who have had no significant 'user' experience.

In this situation it is imperative that 'users' reassert themselves—and the most important job they must wrest back from computer-system people is that of systems analysis.

'Users of the world unite, you have nothing to lose but the shackles of your computer systems'

If alive today, that well-known systems analyst, Karl Marx, might well have uttered this. What is systems analysis? Mr. David Firnberg, Director of the National Computing Centre, believes that systems analysis is a profession close to, but distinct from, computing. The distinction, I believe, is very important. The systems analyst is to a computer-system specialist what an architect is to a building contractor.

Systems analysis in a business environment is the application of techniques, skills and knowledge in order to:

—identify and define an application problem
—investigate an existing system
—analyse the findings of an investigation
—define the operational requirements
—justify proceeding with a study
—design a model total system to best meet the operational criteria
—communicate the design model to all interested parties
—design the host system
—assist in the implementation of the total system and its maintenance thereafter.

It is interesting to note that design features in the list as well as analysis. System design occurs at three levels:

(1) Total system (i.e. the architect's conceptual role).
(2) Host system (i.e. designing the human organization and procedures).
(3) Computer system (i.e. hardware and software engineering).

Those best qualified to become computer-system designers are those who have worked close to machine systems such as programmers and their like. Those best qualified for the other design work are systems analysts with a breadth of experience in administrative systems.

Two cultures

We need to recognize two dissimilar but closely related working groups —one group concerned primarily with human activities, the other with machine activities, to perform the following tasks:

Host system (*human culture*)
(1) Introductory studies of a strategic, conceptual nature. Justification of recommendations.
(2) Detailed investigations and analyses of findings. Justification for further studies.
(3) Conceptual design of total system.
(4) Detailed design of host system.
(5) Specification of operational requirements for the computer system.
(6) Responsibility for implementation, changeover and post-implementation reviews, audit, etc.
(7) Project management.

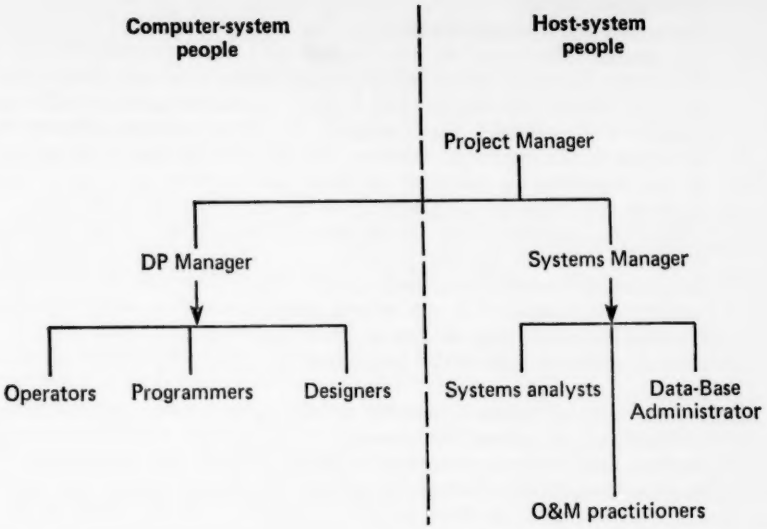
Computer system (*machine culture*)
(1) Participation in (1), (3) and (4) above (as technical advisers).
(2) Design of the computer system to meet (5) above.
(3) Design and production of all software.
(4) Participation in implementation and changeover.
(5) Management of computer-system operations.

The kinds of job titles one would find associated with the two cultures would be:

Host system	*Computer system*
Systems Analyst	Operator
Business Analyst	Operations Manager
Systems Manager	Communications Manager
Information Analyst/Manager	Application Programmer
Data-Base Administrator	Systems Programmer
Project Manager	Communications Programmer
Management Services, O and M, etc	Data-Base Software Programmer
	Program Designer
	Chief Programmer/Programming Manager
	DP/Computer Manager
	Systems Engineer

The recognition that there are two cultures involved with the design, development, implementation and operation of computer-assisted systems will lead to more harmony, not less. Teams would be organized as at present—but roles and relationships would be much better understood (for example, see diagram opposite). There would be a clear working interface between the dissimilar systems—between the systems analyst and computer-system designer via their managers.

The specialists
Computer-system people are specialists. Their training ought to proceed to the most advanced technical levels; they ought to aspire to membership of a professional body such as the British Computer Society.



There is evidence which suggests that some of today's application programmers are not sufficiently professional. Why is COBOL—a language designed for the non-professional—still the main tool used by application programmers? COBOL and flowcharting are together the world's worst design tools. So why do they persist? Professionals worthy of the title ought to be working to eliminate hand coding. Human activity should go no lower than program design; the implementation of the design should be a software matter. Perhaps the advent of the much heralded era of low-cost machine intelligence and memory will encourage this. Design and implementation of the design on a particular target computer should be quite separate processes, but many of today's programmers mix them confusingly, resulting in expensive programs, difficult to maintain and modify.

Apart from application software there are many other areas requiring specialized professional attention—communications, networks, databases, models, operating systems, pre-processors, compilers and a rich variety of packages, utilities, etc.

But the software is only part of the computer system. A specialist task is to engineer a balanced combination of hardware and software. The job title 'computer systems engineer' is a meaningful one for those computer-system specialists whose job it is to design and to bring to fruition a computer system.

The generalists

These are the host-system people. Systems analysts are key members of this group. They need to have substantial 'user' experience and their education should be extended to post-graduate academic levels. Systems analysts should be encouraged to join a suitable professional organization—for example, the Institute of Administrative Management, Institute of Management Services, the British Institute of Management or an organization relevant to their user experience. Some systems analysts may also be members of the British Computer Society.

Systems analysis is the application of techniques, skills and knowledge in order to specify a user's operational requirement and the resources and activities needed to satisfy it. At the basic levels of systems analysis, the analyst is concerned with clerical methods and work measurement; at the advanced levels he is a systems architect concerned with harnessing the combined potential of people and technology.

A crucial difference between a computer-system specialist and a systems analyst is that the training and education of the former would tend to narrow as it advances, whereas that for the latter would tend to broaden. In the United Kingdom the British Computer Society's examination process does become narrower as the level advances, whereas advanced training at a comparable level for a systems analyst broadens to include behavioural science, social science, management science and computer science.

Let's face the future

The development of languages from machine codes to commercial 'high-level languages' is just about at the end of the road. Languages like COBOL are mistakenly called 'problem-oriented'. In reality COBOL is a 'process-oriented' language and complexities in its use stem from problems associated with its implementation on target machines. In the wider sense it is not oriented towards the users' problems.

It seems that the next advance in methodology will come when programmers cease to regard programming as an interesting activity *per se*, to be perpetuated at all costs. They must come to accept that software design and software implementation are two distinct, dissimilar, activities. They should strive to formalize the former and to automate the latter. What then will become of programmers? The more able will become designers of application, communications, data base and system software; produce design-conversion software; become systems engineers. Only a few would be able to make the difficult transition to systems analysis. We must soon cease to regard computer-system work as the natural breeding ground for systems analysts. Systems analysts need to have a primary allegiance to some specialism, vocation or profession other than computers, and their training as systems analysts ought to include elements of, or an awareness of:

—work study and measurement
—analytical methodologies and techniques
—accounting and auditing
—statistics and operational research
—behavioural science
—economics
—systems studies
—business studies.

All these—and more besides no doubt—contribute to systems analysis, the objective of which is to examine a system and its environment in order to help the user to create a 'better' system.

Institutionalizing systems analysis

No one knows a user's task better than the user himself. The trouble is, he has not got the time to stand away from it and be objective about it. Even if he has the time, he has not had the necessary training to enable him to analyse methodically his work and its relation with other people's work. This lack of time and ignorance of appropriate tools, techniques and methodologies is common throughout an operational organization geared to daily survival. And of course it would be an extravagant waste of resources to train and develop all line managers and staff to be their own systems analysts.

So the problem is to find an appropriate institutional solution that will harness the user's understanding of the operational work and future requirements in an effective and economical way.

One thing is certain, selected users cannot be sent down the path trodden first by Lady Lovelace and more recently by other users in the period 1950–70. Computer-system work is now too specialized and demanding. The only practical solution seems to be to extend the work of O and M to include systems analysis. Or put another way, perhaps we need to create systems services units within departments embracing systems analysis, O and M, internal audit and computer systems services. The time has come to extend the meaning of the title 'management' services; the services referred to above would be designed to serve administrative systems, and all who serve in them—not just the management! But the important thing would be the recognition that systems analysis would be the dominant function; it would be staffed mainly by people who had served in 'user' areas of the department and had graduated from O and M work on the strength of experience, advanced training and ability. Let there be no misunderstanding, the kind of systems analyst advocated in this article is a far cry from the analyst/senior programmer often found today—the latter is jack-of-two trades and too often the master of neither.

What about the users and the micro revolution?

In large organizations, especially bureaucracies, it is certain that indiscriminate procurement of micro-computer-based office machines will

be frowned upon, for very good reasons. However, we ought to use these devices in order to release people for doing the kind of work which computers cannot do well. If we can perform administrative tasks more effectively and more economically by using micro-computers then let us use them. The money so saved could be used partly to extend the range of services provided.

The type of person needed to realize the potential of these devices is an O and M practitioner or systems analyst with relevant user experience; the computer specialist is the person to ensure that the devices will do what is required of them—effectively, securely and economically.

So the systems analyst, or O and M practitioner, is the agent of the user. Upon him ought to fall the responsibility for identifying administrative work which could be improved by the application of technology, but at the same time not overlooking any opportunity for enriching the work for people or for extending the range of services provided.

Time for action

It is said that if you want to grow good asparagus you should first dig a trench three years ago! So it is with developing people for computer-assisted administrative systems. The kind of people needed today should have begun their training and development several years ago. But unless we do something now our future stock of systems analysts is going to be a poor one and the Civil Service will be a good deal less efficient, and less effective, than it might otherwise be in the 1980s.

A booklet listing the various management services and computer courses that are being offered by the Civil Service College in the training year September 1979 to August 1980 is now available. Copies of the booklet can be obtained from:

Secretariat
Civil Service College
Sunningdale Park
ASCOT
Berkshire SL5 0QE

(Telephone: Ascot (0990) 23444,
extension 233)

Selection of Staff for Management Services

A. PHILLIPS, Civil Service Department

Tony Phillips is a Principal in Management Services (General) Division, CSD. In the article that follows he expresses some personal views. —*Editor.*

Introduction

Having served at the Civil Service College training newly appointed Management Services practitioners and having, more recently, served in CSD Management Services on assignments that have taken me into many of the larger departments, I have been concerned about the ways in which staff are appointed to Management Services work.

It seems to me that despite all the work within the Civil Service in recent years on personnel management and career planning, staff are still generally selected for promotion or for a move to a new job on the basis of their performance in their present job. This contrasts with Civil Service initial selection procedures and the moves by other organizations towards selection by reference to the needs of the job to be done. However, in practice the Civil Service system operates satisfactorily for most situations because of the similarity of the roles in which the individual finds himself. Outside the general run there are a few jobs which require distinctive qualities and in which the individual is called upon to adopt quite new roles outside his previous experience. One such is that of the MS practitioner. For these the system operates less well.

Theoretically it should be possible to arrange for an individual to serve a trial period of, say, six months, at the end of which either he or the department could, if it became evident that he was unsuited to the job, suggest a move with no loss of face or career prospects. Unfortunately in reality such a suggestion from a member of staff would be regarded in most departments as a failure and the personnel record marked accordingly, while the suggestion coming from the organization would seriously undermine the morale of the individual concerned.

Yet something needs to be done. My experience mentioned above, particularly of trainees on training courses, has shown that a number have been appointed with no desire and, in some cases, little aptitude for the job. Although people can be developed both in the job and on training courses, there will always be some who are unfitted by background, temperament or will to undertake the practitioner role. The purpose of this article is to attempt to set out criteria in the form of a checklist for those responsible for the selection of Management Services

staff. They may find it helpful to read this in the context of John Barker's article 'The O and M-er—A Different Perspective?' (*MSIG*, November 1978, Volume 33, Number 4), which sets out the roles and suggested methods of operation for Management Services practitioners.

Many of the qualities suggested here as helpful for Management Services staff would be valuable, even essential, in many line management situations. Nevertheless, I suggest that these qualities are particularly important for the roles that a practitioner is likely to have to fulfil; roles in which emphasis is placed on interactive skills. There remains the problem that any list of admirable human qualities, however selective, rapidly assumes an impossibly paragon-like appearance in the aggregate. It should be made clear, therefore, that it is not expected that all MS practitioners will possess all the qualities mentioned to an optimum degree but that the presence of these personality characteristics is likely to make a practitioner more effective while the lack of them is likely to make effective performance most doubtful.

Integrity/Credibility

Management Services practitioners must be able to move easily around an organization, to convince managers and staff at all levels and to gain the trust of those whom they are trying to help. It is almost self-evident that lack of integrity will destroy credibility and any chance of gaining the trust of clients. Since the purpose of Management Services is to bring about change, practitioners are really first selling themselves rather than the product. To do this effectively they must be consistent in their dealings with staff of the client organization and must practise the philosophy that is being preached. They cannot afford, at any time, to allow any suspicion of lack of openness, truthfulness or frankness to enter their work. Once people begin to suspect a 'Machiavelli' advice will be ignored and enthusiasm will wane, to be replaced by suspicion and cynicism.

Empathy, tolerance, tact

These three qualities have been grouped together because they are all likely to contribute to the development of an understanding and rapport between practitioners and the managers and staff of the organization. Understanding is essential in overcoming natural human resistance to change.

A practitioner must be able to demonstrate empathy by putting himself in the position of the managers and staff with whom he is working so as to be able to understand how they feel and see their problems. This is not easy, especially when dealing with managers at a level outside the practitioner's experience. It is helpful, therefore, if he already has had some line management experience, certainly to the extent that he has a sympathetic understanding of the day-to-day pressures and problems with which every line manager has to cope. There are, however, two potential dangers: (1) if the practitioner has had line experience in the same function in which he is operating, particularly if he is

senior in grade to those with whom he is in contact, there is a very strong temptation to drop the neutral role, to dominate proceedings and to impose his own ideas; and (2) by trying to think and feel as the managers do, he may become over-involved in the organization and thus lose his ability to be objective and impartial. This requires a strong will and a resilience to frustration. (Or a conscious policy on the part of Management Services management not to send a practitioner back into his old home territory.)

In any large organization there are people, at all levels of varying degrees of ability. Some think more quickly, grasp new concepts and ideas more easily, are more self-critical and objective or are more sympathetic to change. Others are less so. It is with these that frustration and impatience must be avoided if their commitment is to be gained and co-operation maintained. As an outsider, too, the practitioner can often see things that are wrong or new ways of doing things that the manager or staff in post are unaware of or take a long time to appreciate. This can be frustrating and there is a temptation for the practitioner to try to speed things up by forcing his own ideas. The practitioner therefore should, while having the strength of character to work alone and stand up for his ideas, not be aggressive by nature. He has to show tolerance. In extreme cases tolerance may extend to support, even if only by listening, with personal problems which are having an effect on the performance of the job.

Often the practitioner will encounter people who, whether it is true or not, will believe that they know more about the organization, the job and even the changes proposed, than he does. There will be others too who have irritating mannerisms or foibles which may be causing problems. In some cases only direct conflict will effect a cure but in most situations tactful counselling will achieve the best results. Apart from making commitment more likely, adopting a supportive role is modelling the behaviour that the manager should adopt with his subordinates. There will be times when it will be necessary to speed up the process of change with managers who seem to need more direction than others. This should be done in a way that leaves the manager's self-respect intact and does not undermine his confidence. It is this to a large extent that is meant by tact in interpersonal relations. Tact does not mean that practitioners do not, when it is necessary, confront managers with aspects of their behaviour that create difficulties for the organization. It does mean confronting them in a way that helps them to see the problem and try to change their behaviour in a constructive way.

Outsiders to parts of an organization often face initial derision or even hostility when they are involved in making changes. This is partly a process of the members of the organization testing out the outsider and partly an expression of fears and insecurity. Tolerance and tact will enable the practitioner to cope with this initial phase and help him to establish credibility and rapport.

Tenacity, stamina, resilience, sense of humour

These might be regarded as the survival qualities which Management Services staff need in abundance. The job of helping an organization systematically to improve its management systems and procedures involves sharing the problems of that organization both at the corporate and individual level. Although the responsibility for solving the problems remains with managers and staff, the practitioner's task can, nevertheless, be a demanding one.

The job often involves long periods of working in what is at first felt to be an alien environment. For reasons beyond the practitioner's control the staff may be suspicious for a time of his real intentions and, where their workload is heavy, may regard him as 'not having a proper job'. They may initially feel that he could make a greater contribution by relieving them of some of their work. Where the practitioner is working on his own he may himself feel a strong need for counsel and support. All these things conspire towards seeking relief by too close an identification with the organization with its inevitable lack of subjectivity. Similarly it is too easy to be diverted from solving the main (difficult) problem towards easier problems or towards maintaining the *status quo*. It is therefore important to keep in view at all times the aims of the assignment.

Management Services work can often involve a considerable amount of travelling; it more often involves long hours in order to keep to schedules or because some managers wish to carry on discussing problems after normal working hours. The variety of demands made upon the practitioner and long periods of concentration while interviewing or talking to managers and staff can be very tiring. Considerable stamina is needed to keep going over intensive periods.

Because of his enthusiasm and belief in what he is doing it is also easy for the committed MS man to take himself and his work too seriously. This attitude will be exacerbated by the problems mentioned above. He must, therefore, keep a strong sense of humour and be prepared to laugh at himself if necessary. In this rests his survival!

Controlled enthusiasm

The Management Services man is the catalyst for change within a department. His involvement in management situations can be difficult to keep in balance. He must be able to bring enthusiasm into his work and also be able to inspire enthusiasm in the managers with whom he will be working. Some managers will require more support and encouragement than others; there will be periods when things appear to be going badly or slowly and managers may wonder if they have been well advised. Practitioners may have to give more encouragement and support at these times. It is also important that Management Services staff be committed to their work. Experience has shown that staff find it very difficult to become committed to a new system or methods or to some improvement in a system if the person advising

them is only going through the motions because 'that's the job he has to do'. On the other hand the Management Services man's own feelings about his job will vary with his successes and perceived failures and he must avoid communicating any temporary depression arising from failures. He must, therefore, be careful to demonstrate his enthusiasm but ensure that this enthusiasm for the assignment in which he is involved is kept under control. If he gives the impression of being an evangelist he will reinforce resistance to change—people are very wary of over-enthusiasm in any field.

Written and oral expression

Management Services staff will be required to explain the implications of change; to lead others to reach conclusions; to work with others in a project team; and to anticipate and handle any disruptive incidents that might lead to recrimination during meetings, etc. They must also be able to put together in a suitable form papers for senior management and to draft circulars and instructions for staff. To do these effectively the practitioner must have an ability to express himself clearly and concisely, both on paper and orally.

Age, status, education

Although the age of the practitioner is not the prime consideration, it cannot be ignored when it comes to selecting staff for Management Services. The aim should be a balanced unit consisting of members with operational experience as managers, with some knowledge of the operations and technology of the department and having some 'staff'/advisory/problem-solving expertise. The unit may include one or two rising young managers or fast streamers who will spend two to three years in Management Services as a valuable part of their own development; the quality of each practitioner must be demonstrably high. I have already suggested that the work is tiring and it can be frustrating; it would be unwise for mature officers to become Management Services practitioners unless there were clear indications that they had the necessary flexible and questioning approach, as well as a certain amount of physical and intellectual stamina.

The precise educational discipline does not appear to be important. What is important is that those selected have considerable ability for clear and analytical thinking, combined with the ability to be accepted by and get on with people.

Conclusion

One quotation will serve to emphasize the points I have made above. It comes from another related area but nevertheless seems to me pertinent to the success of Management Services in the future:

> . . . those concerned must be content to get their job satisfaction indirectly from helping others to be successful, rather than directly by being problem-solvers themselves. ('A Plea for Fundamentals' by L. Titman and J. Foden, *Management by Objectives Quarterly*, Volume 1, Number 4.)

Applications of OR to VAT Control

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Introduction

The application of scientific method to the problems arising from the management of large systems involving people, machines and money is illustrated in this case study of Operational Research (OR) in Value Added Tax (VAT). OR and VAT have, in fact, grown up together in Customs and Excise, their newness in a traditional department causing them to turn naturally to each other. VAT was introduced in April 1973 and from small beginnings in 1974 the OR Unit of Management Services Division has devoted much of its time to assisting the VAT Control Directorate in some aspects of administering the tax. This article describes the work performed during the past two years and indicates the usefulness of applying statistical techniques to the administration of VAT.

VAT is generally chargeable on the supply of most goods and services in the United Kingdom. A trader whose supplies exceed £10,000 in value per annum is required to register with the Department for tax purposes; at present there are about $1\frac{1}{4}$ million registered traders. These traders normally assess their tax quarterly in arrears and send the VAT due and their tax returns to a central collection point, the VAT Central Unit at Southend, where a record of the payments and the results of visits is kept. The existence of this large amount of centrally held data has enabled some OR methods to be applied very readily to the VAT system.

Complementary to the VAT Central Unit and other VAT headquarters offices, there is a network of nearly 100 local VAT offices covering the country. About 8,500 staff in these offices have day-to-day responsibility for the operation of VAT. One function of the VAT Control Directorate is to decide operational policy for the deployment of local staff and the OR Unit has played an important part in providing information and advice in this area.

VAT control is achieved principally by a system of verifications carried out at traders' premises supplemented by the centralized monitoring of traders' tax performance. Visits to traders can vary from simple registration visits to new traders when the details of the VAT system are

explained, through regular scheduled control visits, to special visits where irregularities are suspected. The general purpose of the control is to ensure that traders' tax returns are correct and that their tax accounts are adequate. Specifically the purpose of VAT control visits is to safeguard the revenue by:

(*a*) Helping traders to fulfil their obligations by improving their understanding of VAT.
(*b*) Correcting traders' errors and thus preventing tax from being under-declared in the future.
(*c*) Recovering under-declared tax.
(*d*) Deterring traders from under-declaring tax.
(*e*) Up-dating and improving the information used for tax administration.

The scale of the VAT operation can be appreciated from the results reported for the 1977/78 tax year. About 400,000 visits were made and these resulted in the discovery of a total under-declared tax of over 1 per cent of the total VAT revenue of about £4,000 million. It is clear, therefore, that even relatively small improvements to the control arrangements can result in the more timely collection of millions of pounds of tax.

The involvement of the OR Unit

A great deal of information is brought together in the VAT Central Unit and before the OR Unit could carry out statistical analyses it was necessary to plan and establish a data file containing details of the visits made to traders. The type of information and the means of storing it were the subjects of meetings which took place throughout 1976. The OR interest was represented and the resulting 'Visit Analysis File' became operational at the start of the financial year in April 1977. The setting up of this data file was directly relevant to improving the information to be used for operational policy decisions concerned with VAT administration.

Following the introduction of the Visit Analysis File the OR Unit undertook a number of projects concerned with analysing the reports of visits and the under-declarations arising from them. It was considered that the research would have three main uses:

(*a*) Devising ways of allocating staff resources according to relative needs.
(*b*) Identifying traders in need of special control because of unacceptable revenue risks.
(*c*) Providing information at both local and headquarters levels to involve management in control strategy and to assist in the determination of priorities.

Before these topics are discussed it is appropriate to give a brief resumé of the general involvement of OR in VAT control and the techniques

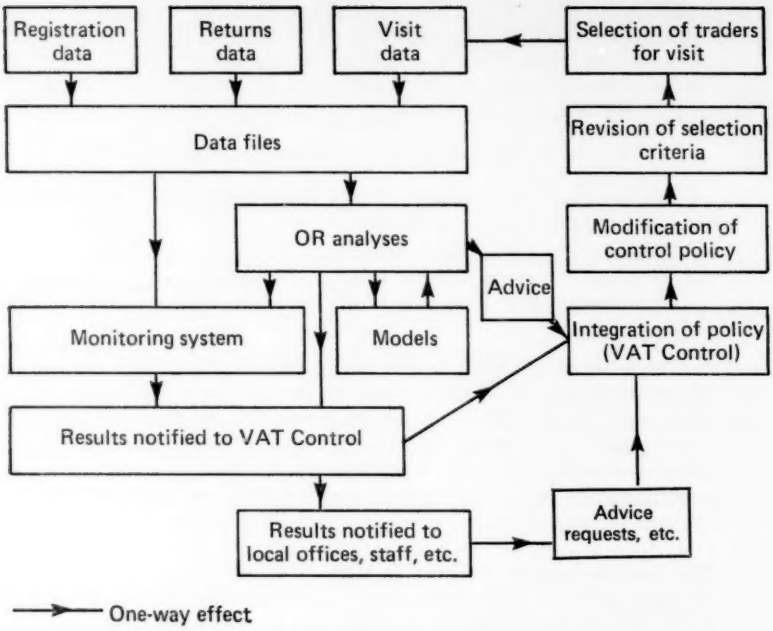

Figure 1. Involvement of OR in the operational policy of VAT control.

of the analysis. The relationship is illustrated in the schematic diagram (*Figure 1*).

Starting at the top left of the diagram the three sources of information are shown: (1) details supplied by traders when they first register; (2) items from the quarterly returns submitted by traders; and (3) information supplied by the visiting officers. The design of the various OR analyses is based on conceptual models of trader behaviour which are tested and validated by the results obtained.

The results of the analyses are used in a number of ways. They are notified directly to the Control Directorate who consider their impact on control policy and disseminate a digest of the information to staff in the local offices and to other interested parties, who can make requests and offer advice on policy matters. In addition, the results are used to derive a means of monitoring the effects of control. Finally, the OR Unit uses the analyses for formulating the advice it offers the Control Directorate on explicit aspects of operational policy concerning, for example, the deployment of control resources.

Referring to the right-hand side of the diagram a modification of control policy results from the deliberations of the administrators of VAT in sifting the information from the various sources. This modifi-

cation leads to a revision of the criteria for selecting traders for visits which in turn leads to a different selection of traders to be visited. This new pattern of visiting will have an effect on the totality of data collected from visits now that the whole process has gone through the first full cycle. The monitoring system now plays an important part in notifying the effects of the policy changes to the Control Directorate who can use the information further to tune the control system.

The techniques of analysis

Readers hoping to find enlightenment in the use of the more sophisticated OR techniques will be disappointed. The work has been of an exploratory kind and technically very simple. We have tried to provide statistically sound interpretations of large amounts of data for management in VAT. By keeping the analyses simple, the working relationships and exchange of ideas between OR staff and administrators have been made more fruitful.

The basic approach has been to subdivide a sample of VAT traders into groups by considering various attributes and to examine the tax behaviour of the groups. We have characterized the behaviour of a group of traders in terms of two key parameters: the incidence of under-declarations and the mean under-declaration per visit. The first parameter is measured by the percentage of visits resulting in the discovery of an under-declaration of tax and the second by the sum of under-declarations found divided by the number of visits made. These parameters can then be compared for different groups of traders to establish whether there are any statistically significant differences between them.

In interpreting results, more care has to be taken in considering the composition of a group than in applying statistical tests. For example, traders can be grouped according to their types of trade (trade classifications) and at first sight there may appear to be significant differences between one trade class and another. However, closer inspection of the groups may reveal that the members of one group are large traders and the members of the other are small. Since size may have a considerable effect on tax behaviour, due allowance must be made for it when comparing trade classifications.

In general traders have many attributes, some interrelated and some independent. When large numbers of traders have to be considered together, the task of interpreting results poses problems of considerable complexity. It is envisaged that when a greater understanding of trader behaviour has been developed, the application of more advanced statistical techniques will be possible.

Resource allocation

Having described some of the background to the work it is now appropriate to discuss the three topics where OR has made the most impact. The first of these may generally be considered as an exercise in resource

allocation. If the visits made annually (400,000) were equally distributed amongst the $1\frac{1}{4}$ million registered traders, each trader would receive on average one visit in a period of about three years. However, it would be unreasonable to visit a small one-man business as frequently as a large company with diverse interests. The intensity of control can be varied not only by changing the interval of time between successive visits but also by altering the length of the visit itself. We can safely assume that the visits to large companies in general will take longer and be more frequent than visits to smaller members of the business community. The problem then is to devote resources to traders according to need and in keeping with the general constraints of tax policy.

In the VAT system there has always been a matching of this need to the allocation of control effort but, because the administration of a new tax is developed continuously in the light of further knowledge, it is only recently that information has become available that allows improved discrimination among traders to be made. Detailed analyses of the results of visits have led to the identification of factors that can be associated with need and these factors can be used to determine the durations and frequencies of visits for groups of traders. To demonstrate the need for a revision of the pattern of visiting, two cumulative curves of the recovery of tax as a direct result of visits are displayed in *Figure 2* opposite. Visits are accumulated in order of importance and for the addition of each level of importance the number of visits and the amount of revenue recovered from them are expressed as percentages. In the lower curve the visits have been added in the order of their existing specified resource intensity. The more intensive visits account for a smaller proportion of the total number of visits and a larger proportion of recovered tax as shown by the steep initial part of the curve.

The upper curve is constructed by combining certain attributes which can be associated with need into a single factor. The visits are then accumulated in order of diminishing values of the factor and cumulative proportions of the visits and recovered revenue are calculated. Because this curve rises more steeply and is above the curve relating to current resources it shows that this factor is more discriminating between different needs of traders than is the present control system. A reallocation of resources on the basis of the factor is then likely to lead to an improvement in the recovery of under-declared tax, which is one of the objectives of control of the tax. Although these curves are based on *post facto* analyses of visits, research has indicated that the factor is a good predictor of the outcome of future visits.

However, other aspects of control suggest that additional factors should be considered in reallocating staff resources. In the reallocation system proposed to the Control Directorate, three factors were used. This system allows the control need to be reviewed, is consistent with the results of the research and allows appropriate levels of control to be decided. In the short term the system offers a more rational alloca-

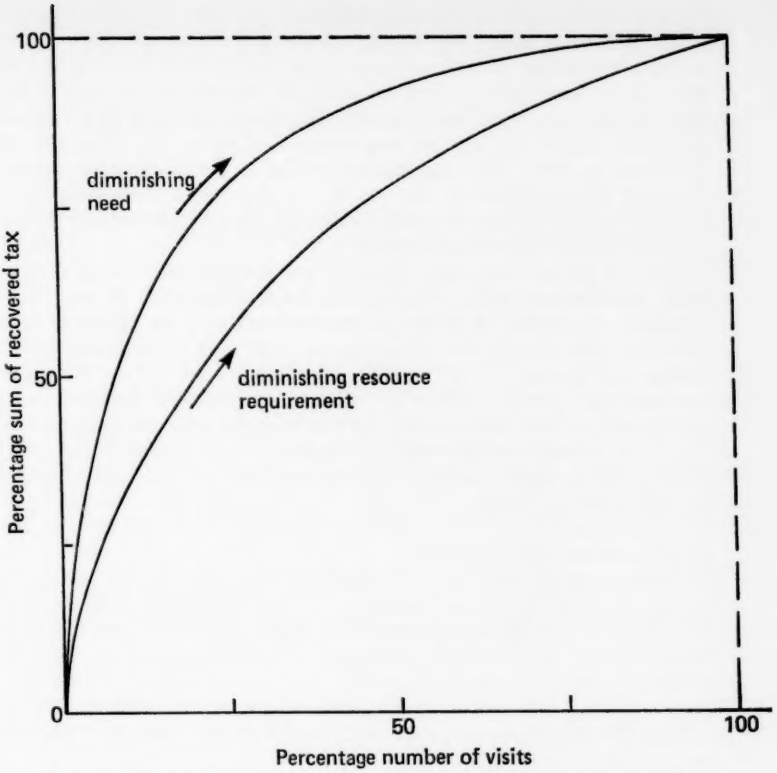

Figure 2. Cumulative graphs of the recovery of tax and the number of visits.

tion of control effort and the prospect of a higher future level of recovered tax.

The identification of traders in need of special control

The second area of work in which OR has had considerable involvement is the selection of traders for special control because of unacceptable revenue risks. The treatment in these cases usually takes the form of special visits outside the prescribed pattern of normal control visits described in the previous section.

In the resource allocation project, the data required came mostly from the reports of visits with some small contribution from details furnished by traders on registration. For this work, however, the information furnished by the quarterly tax returns submitted by traders is also used. From an aggregation of details on the returns over a period of time, various parameters are calculated for each trader. The para-

meters may be used to identify abnormal groups of traders. The process of identification may, depending on the particular parameter, involve comparison of its value for a particular trader with that for the trader over a previous time period or with the values for a group of similar traders over the same time period. The results of visits to an abnormal group of traders can be used as a measure of the worth of the parameter in assessing risk. This approach is valid if the parameter values are causally independent of the results of the visits analysed; this was ensured by examining all normal visits which took place after the period to which the parameters related.

Several parameters were investigated individually in this way and their associations with revenue risks were identified. It soon became apparent, however, that the parameters were more effective in combination than singly and following on from this a composite indicator of risk was developed and applied to each trader. When the results of normal visits were analysed by traders grouped by risk indicator there was a marked difference between the average revenue recovered from the higher risk group and that from the lower risk group. This technique of identifying risky traders supplements the level of control provided by the scheduled visits.

Provision of information

The third application of OR analyses has been in the provision of information for local and headquarters management. One example is the compilation of comprehensive descriptions of particular trade classes which can be used to improve local managers' knowledge of the traders in their areas. In headquarters the information can be used for evaluating relative control needs. A further use is in training local officers by acquainting them with the characteristics of trade classes they have not previously visited.

Conclusions

The administration of a large tax system such as VAT involves the resolution of complex issues of operational policy. This article has indicated some of the ways in which OR has been used to assist the managers of VAT in directing staff effort to good effect. In particular it has shown how OR techniques have identified categories of trader more deserving of control attention than others. The OR analyses have also helped to indicate the information that management needs on a regular basis for monitoring the control programme and adjusting the operational policy for the efficient administration of the tax.

Intellectual Property Rights

A. N. DEVEREUX, Procurement Executive, Ministry of Defence

Austin Devereux is Principal Director of Patents, Procurement Executive, Ministry of Defence. In the article that follows he describes the work of his Directorate.
—*Editor.*

Introduction

The Principal Directorate of Patents is part of the Procurement Executive of the Ministry of Defence (MOD), but its operations extend across the whole of MOD and into other departments. It carries out a blend of legal and technical work in the area of what are known as 'Intellectual Property Rights', hereinafter referred to as IPR for brevity. Patents are in fact only one variety of IPR, though probably the most widely known, and the title of the Directorate is accordingly something of a misnomer.

Legal background

To appreciate the work of the Directorate some explanation of the legal background is necessary. IPR can be regarded as the legal rights which exist in technology, i.e. inventions, designs, technical information, know-how, etc. It is by virtue of these legal rights that the owner of technology can control its disclosure, use and exploitation. Thus he can reserve its use to himself or he can give permission to others to use it, and in either case seek to secure a financial return or other advantages from his investment in generating or developing the technology.

Some forms of IPR are statutory in that they come into existence or can be created by the operation of specific legislation—the Patents Act 1977, the Registered Designs Act 1949, the Copyright Act 1956, the Trade Marks Act 1938 and equivalent legislation in other countries. Thus it is possible to secure protection for an invention by means of a Patent; this gives the owner the right to take legal action against anyone using his invention without his permission. A rather similar form of statutory protection, Registered Designs, is available to protect ornamental designs and the like. The law of Copyright enables an owner to prevent the copying of 'literary' and 'artistic' works, and as these can include such material as manufacturing specifications, engineering drawings and computer programs, copyright affords protection in the technological as well as the purely literary and artistic fields. Yet another form of statutory protection which can sometimes be relied on is a Registered Trade Mark.

However, some forms of IPR arise by virtue of common law or equitable principles through the operation of the law of contract or confidentiality. For example, the design of a particular equipment is often not capable of being protected by a Patent or Registered Design, but as long as the technical information and know-how relating to the design are not made available to the public, they still constitute a valuable piece of property in the hands of the owner in that he has knowledge not available to anyone else. Also legal techniques have been developed whereby such technical information and know-how can be disclosed to others only under conditions of confidence and subject to licence agreements. In this way the recipient of the knowledge—the licensee—can be put under a contractual obligation not to make any further disclosure, to use the technical information and know-how only in the manner prescribed in the licence and to make payments or afford some other benefit to the owner.

It is well recognized that IPR constitute valuable industrial and commercial tools, and in recent years there has been an unprecedented upsurge, both nationally and internationally, of interest in the relevant law. Notable evidence of this has been a complete overhaul of the patent law in the United Kingdom and other countries, the establishment of a European Patent Office and the establishment of a Patent Co-operation Treaty. There is also a prospect of a unitary patent for all EEC countries within the next few years. On the other hand there has been concern in EEC lest IPR could be used to hinder competition and the free movement of goods within the Community, and this has led to the issue of various directives and regulations by the EEC Commission and to decisions by the European Court of Justice. Also the 'information explosion' has reached the IPR field, and there has been a flood of textbooks, periodicals, articles, conferences and seminars. All this has meant that industry and government have had to display a much greater 'IPR awareness' than in the past.

Work of the Directorate

MOD necessarily has a vital interest in the generation, development and use of technology in the field of defence, and hence must concern itself with IPR as they impinge on departmental interests. Similar considerations apply to other departments, most notably Department of Industry by virtue of its broad sponsorship responsibility for many branches of industry, and also to, for example, the Departments of the Environment, Transport, Energy, and Health and Social Security by virtue of their particular responsibilities in their individual fields.

Generally speaking it is the function of the Directorate to provide the necessary advice, assistance or executive action to ensure that on the one hand MOD operates in accordance with the law relating to IPR and on the other hand that the tools which IPR afford are utilized to the best advantage to further departmental objectives. On specific request or pursuant to standing arrangements, the Directorate per-

forms the same functions on behalf of other departments, and in practice work for other departments amounts to some 25 per cent of the Directorate's effort. Some of the ways in which the Directorate operates are outlined below.

Where technology generated or developed intramurally within a government department, for example in a Research and Development Establishment, amounts to an invention, it is the responsibility of the Directorate to seek patent protection in the United Kingdom and elsewhere as appropriate. This involves the drafting of patent applications, filing applications in Patent Offices in the United Kingdom and elsewhere, and dealing with the objections raised by the various Patent Offices during examination of the applications. In this respect the staff of the Directorate are acting as Government patent agents; however, their responsibility extends beyond that of a private firm of patent agents in that they do not merely deal with inventions brought to them but rather they must, at least as far as MOD is concerned, 'ferret them out'. To this end staff of the Directorate are located in some MOD Research Establishments, while regular visits are made to other MOD establishments with the object of keeping in touch with the latest developments.

Notable MOD inventions for which the Directorate has obtained patent protection include carbon fibres, the 'Ski Jump' for assisting the launching of aircraft from ships, a liquid cooled space suit which formed the basis of that used by the Apollo astronauts, surface acoustic wave devices and a novel liquid crystal material which is coming into widespread use in instrument displays, watches and other applications. In the same way the Directorate sometimes files applications for Registered Designs and Registered Trade Marks. Where it is impossible to seek patent protection the Directorate can advise on the conditions under which information on departmental inventions, designs, etc can be released so that a measure of protection can be maintained.

In some instances the patent rights secured by the Directorate are assigned to the National Research Development Corporation, a statutory corporation which has the function of securing the development or exploitation of inventions resulting from public research. The patents on carbon fibres were handled in this way. However, in other circumstances the Directorate itself seeks to exploit MOD inventions and designs through licensing. In the last few years a lot of effort has been put into the licensing of the patents on liquid crystals referred to above and substantial returns are now coming in. It is of interest that the firm to which MOD granted a licence under these patents has, in conjunction with the MOD establishment concerned, recently been given the Queen's Award for Industry for their work on liquid crystals. Also the Directorate seeks to exploit MOD designs even where no patent protection exists, and in recent years has achieved notable results by licensing in fields as far apart as military bridging and computer programs.

MOD inventions and designs are also exploited by licensing foreign governments through the MOD Defence Sales Organization, while other departments—notably Departments of Industry and of Health and Social Security—themselves carry out exploitation of inventions for which patents have been obtained by the Directorate. The Directorate advises and assists in these activities and sometimes negotiates licence agreements on behalf of other departments.

Even where a departmental invention cannot be actively exploited in any of the ways referred to above, the Directorate often seeks to secure a patent for defensive reasons. A departmental patent will prevent others from getting patents on the same invention or minor variations of it, while it may also be used as a bargaining counter where a department is faced with a claim for payment in respect of use of IPR owned by others.

Where IPR owned by others are used by or on behalf of MOD, the Directorate has specific executive responsibility for negotiating and settling terms of use. This may be done before or after use occurs. In this respect the Directorate operates under statutory powers available to government departments which enable them to use patents but impose obligations to notify patentees and to agree terms. Nowadays it is very common for a MOD contractor to be manufacturing under a licence agreement with a third party covering the use not only of patents but also of technical information and know-how, and it is the responsibility of the Directorate to decide whether the terms are acceptable and if not to seek to renegotiate them. Where a licence agreement is being entered into specifically to enable the contractor to undertake work for MOD, such as the United Kingdom manufacture or servicing of a foreign design, the Directorate will seek to be involved in the negotiation of the licence agreement from the outset so as to ensure that the terms agreed between the parties are acceptable to MOD. By so doing it is frequently possible to secure wider rights and/or better terms for the Ministry than are available commercially, with substantial monetary savings, often in foreign currency.

Usually it is possible to settle claims by negotiation but in the last resort the owner of the IPR can take legal action and the Directorate is then responsible for preparing the Department's case before the courts. It is, perhaps, a measure of the Directorate's success that so few cases actually reach the courts. On average there are always some two or three cases in preparation for hearing but the majority of these are finally settled out of court. Among those taken to a hearing, however, has been a test case on interpretation of the statutory provisions governing use of patents by government departments in which the Court of Appeal confirmed the basis for settlement long followed by the Directorate. In another, a French concern launched an action under their patents in respect of aircraft gas turbine engines. The potential liability was very large indeed but the Directorate was convinced that the patents were invalid and not used anyway, and in the end was able to

persuade the court to rule against the patentees. In other cases involving, for example, ship stabilizers, semi-conductors and integrated circuits, where claims have been made by foreign patentees against both MOD and sections of British industry, the Directorate has co-operated with industry and co-ordinated action so as to secure better terms for all than could have been obtained by any one user.

The Directorate is, of course, accustomed to deal with claims, or settle licence terms, in respect of use of IPR by other departments. A current example is an action now being pursued by a French patentee against the Department of Transport in respect of use of their patents on reinforced earth. Sometimes the Directorate will be concerned with use of IPR by other governments where they and the United Kingdom Government have a common interest, particularly in the field of international collaboration. A current example is the claim by a Swedish company against the governments of West Germany and Italy as well as United Kingdom for use of a patented form of shell filling.

A further responsibility of the Directorate is the negotiation and settlement of claims for compensation for any MOD misuse of IPR, such as through breach of contract or confidence.

The Directorate also services the MOD Committee on Awards to Inventors which is responsible for recommending ex-gratia awards to MOD staff, including service personnel, in respect of their inventions. A notable case dealt with recently has been that of the 'Ski Jump' mentioned above. The Committee is also prepared to make recommendations for awards to staff in other departments. Departmental responses to appeals to the Central Committee on Awards are prepared by the Directorate.

Much of the research and development work for which MOD is responsible is done extramurally under contract, and it is necessary to ensure that the contracts include appropriate IPR provisions so that on the one hand MOD can use the resultant technology and authorize others to do so to the extent necessary to meet MOD and governmental objectives, and on the other hand the legitimate commercial interests of the contractor are safeguarded, especially in relation to overseas governments and industry. The usual approach is that the IPR arising out of the contract will be owned by the contractor but MOD will have access to them to the extent required. Over the years a number of more or less standard provisions have been evolved and agreed with United Kingdom industry, but the Directorate is called on to advise on non-standard situations and problems arising on particular cases.

In recent years there has been a deliberate move towards international collaboration in research, development and production in the defence field, and it has been found that such international projects nearly always present many difficulties in the IPR area. This is partly because the law relating to IPR in different countries while generally similar is not identical. More importantly, however, the participating governments and their contractors will not necessarily have identical

objectives, and the more parties there are, the more difficult it is to reconcile the differing interests. Generally speaking there will be no dispute as to the requirement for all technology generated in the course of the project to be available to the participants at least for the purposes of the project. In practice it will also be necessary to have access to technology controlled by the participants but generated outside the project, and this requirement often gives rise to difficulty, particularly as to the terms on which the technology should be made available. Further, in some cases one or more of the participating governments may wish to have still wider rights to use the technology outside the specific project, for their general defence or governmental purposes, and this can lead to an imbalance between the contributions of and benefits accruing to the participants.

It is found that the possible international collaboration situations are so varied that it is not possible to use anything like standard IPR provisions, and the Directorate is required to devise provisions for both the inter-governmental arrangements and the contracts placed in pursuance of the projects practically on a case-by-case basis. Staff of the Directorate are called on to take part in many negotiations with other governments, and in doing so they play a part in formulating the objectives of the collaboration in the first place. The Directorate will, of course, become involved in any follow-on activities on the IPR aspects of international collaboration. One project which has involved the Directorate at a number of successive stages is that of the Tornado aircraft being developed and produced jointly by the United Kingdom, the Federal Republic of Germany and Italy.

The Directorate is similarly called on to advise and assist other departments on the IPR aspects of international collaborative arrangements outside the defence field. It has, for example, been concerned in evolving the IPR provisions for a number of research projects in the EEC field and for international treaties in the space field.

Another continuing responsibility of the Directorate is to advise departments such as Department of Industry on the IPR aspects of industrial sponsorship contracts where the objective is usually to promote the use and exploitation of the resulting technology by industry. In this area some more or less standard IPR provisions have been evolved, but non-standard situations often arise for which the Directorate is called on to produce special provisions.

Staff

The professional work of the Directorate is carried out by officers in the departmental class of Patent Officers. Generally staff enter with a first- or second-class honours degree in science or engineering, or an equivalent or higher qualification, and gain their knowledge of the law of IPR after entry. However, from time to time there have been new entrants with experience gained in the private patent profession. Officers have the opportunity to take the examinations qualifying them as

Chartered Patent Agents. The work can be attractive to those with a good basic scientific or engineering background who want to see a broad field of technology and to take part in the formulation of quite broad policy decisions.

Conclusion

The Directorate aims to provide for MOD a comprehensive service in the field of IPR, and within the limits of its resources is available to provide a similar service for other government departments.

Some recently published titles received by The Editor

How to Communicate by Gordon Wells. Published by McGraw-Hill Book Company (UK) Limited; 192 pages.

Introduction to Work Study (*Third Revised Edition*). Published by International Labour Office, Geneva; 442 pages; price £6·25. The original version of this book was published in 1957. This third (revised) edition includes a number of new chapters; others have been modified or rewritten.

New Forms of Work Organization (in Denmark, Norway and Sweden, France, Federal Republic of Germany, the United Kingdom and the United States). Published by the International Labour Office, Geneva; 173 pages; price 25 Swiss francs.

The Recall Method in Social Surveys. Edited by Louis Moss and Harvey Goldstein. Number 9 in the Studies in Education series published by the University of London Institute of Education; 176 pages; price £5·95.

Management in Central and Local Government by John Bourn. Published by Pitman Publishers Limited in their Government and Administration series; 268 pages; price £5·75.

Labour Market Services in Britain and Germany—Employer and Trade Union Participation by J. B. Carruthers. Published by the Anglo-German Foundation for the Study of Industrial Society in their Monograph series; 52 pages; price £2·50.

Management Bookshelf

Keeping Informed on Office Technology

Mrs. B. M. HOWARD, Civil Service Department

Introduction

Communications are the lifeblood of any organization, but office electronics are advancing so fast that today's marvels could be tomorrow's expensive discards. Managers responsible for the procurement of equipment must continually strive to keep informed about the advances in printing, typing, copying, mail handling, microforms and telecommunications. Only in this way can they ensure that money is spent wisely.

There are no textbooks on 'The Office of the Future'. The field is too new and is developing too rapidly; by the time that a book is published, the system described may already be obsolete. The first line of defence should be the scanning of specialized journals and their advertisements; the second defence is trade literature; the third might be reports and descriptions of other people's experiences; books are useful only as broad-brush surveys or forecasts of future scenarios.

Journals

So far as trade journals are concerned, the following are recommended: *Business Equipment Digest* (published monthly by BED Business Journals Ltd; available on 'controlled circulation' terms—that is, without charge in the United Kingdom to those who qualify by virtue of their job titles); *Business Systems and Equipment* (monthly; Maclean-Hunter Ltd; £10·00 a year, but available on controlled circulation); *Office Equipment Index* (monthly; Maclaren Publishers Ltd; £12·00 a year, also controlled circulation); *Office Equipment and Furnishing* (monthly; Patey Doyle Publishing Ltd; £15·00 or controlled circulation); *Which Computer?* (monthly; £18·00 a year; published by Which Computer? Ltd, in association with the Institute of Data Processing Management and with assistance from the National Computing Centre's Information Services). The Readers Inquiry services of these journals will provide access to further details of the products and services described. This trade literature is usually available without charge. So far as daily newspapers are concerned, the *Financial Times* is a particularly valuable source of news and comment on office technology. Two weeklies, *Computing* (Haymarket) and *Computer Weekly* (IPC Electrical-Electronic Press Ltd), are available on a controlled circulation basis.

The trade journals typically only carry brief comments on equipment; longer articles may appear in a variety of magazines. The most practical way of discovering what is being published is to scan an

abstracting service. Two are relevant: the National Computing Centre's *Computing Journal Abstracts* (fortnightly) and Anbar Management Publication's *Work Study and O & M Abstracts* (eight a year). An example of the more thoughtful type of article is 'Prelude to the '80s: A special report', published in *Administrative Management*, January 1979, pages 25–53. This looks specifically at likely changes in office systems; another Special Report, 'The DP Industry in Transition', *Datamation*, 15th November 1978, examines the whole data processing environment but includes two sections on 'The Automated Office' (pages 154, 156, 162, 168) which consider some of the human factors involved.

Directories

It is often useful to have ready access to specialized trade directories which give details of manufacturers and the equipment they supply. Sometimes publications of this sort provide additional information and become quite invaluable 'tools of the trade'. Two such have been issued by Computer Guides Ltd: *Guide to Small Business Systems 1979* (160 pages; £24·00) and *Guide to Word Processing Systems 1979* (115 pages; £24·00), both edited by I. St. J. Hugo. These contain a substantial amount of very helpful text, allied to tabular presentation of facts. Both are well written, progressing from a plain man's guide through systems aspects to quite detailed evaluations. Each has a number of tables which compare the facilities offered by competing manufacturers—useful information for the prospective user. The guides are not intended to earmark 'best buys' but 'to provide the non-technical reader with insight into the types of system available and arm him with sufficient understanding to be able to undertake the process of selecting a system suited to his needs with justifiable confidence'.

A 'straight' directory, consisting only of tabular material, is the *Business Equipment Guide* (published twice a year by BED Business Books, Ltd; standing orders £8·00 a copy, single copies £9·50). In many categories (ranging from acoustic screens to word processors) it schedules the features of a great many models and systems; among the information included is the recommended retail price of each.

Human aspects

Some of the human problems likely to be posed by 'the chip' have been examined by the Association of Professional, Executive, Clerical and Computer Staff (APEX) in a report entitled *Office Technology: the trade union response* (1979; 68 pages; £2·00, £0·50 to members of APEX). It looks particularly at word processing since this is the first manifestation of future trends and concludes that, provided the right conditions can be met, word processing should be welcomed and encouraged. The requirements include a large-scale programme of education and training, the establishment of appropriate negotiating machinery and appreciation by Government of the dangers as well as the benefits of the new technology.

Word processing

The previous (May 1979) issue of this journal carried on pages 86 to 89 an article by Eric Smith, 'A Word Processing Pilot Project'; a more detailed report (35 pages) *Word Processing by Computer: a report of the pilot project at DES Darlington* is available without charge from the Central Computer Agency, PIB, Riverwalk House, 157–161 Millbank, London SW1P 4RT.

An antidote to being carried away in quest of 'trendiness' is the LAMSAC report on *Word Processing* (1978; 2 volumes; £4·00). This observes: ' "Word Processing" is a phrase understood to have been coined about six or seven years ago by a manufacturer in an attempt to create a new image and market for "automatic typewriters" '. The authors of the report did not wish to restrict their thinking to computerized typing systems, and warn against too facile an acceptance of demands for automatic/electronic equipment. They give a set of guidelines which might be used to assess any demands for enhanced typing facilities. The report itself is a down-to-earth O and M examination of fashionable predelictions for innovation for the sake of innovation.

The microelectronic future

The concept of Office of the Future embraces very much more than word processing; most scenarios envisage a series of work stations, replacing the contemporary desk, which will embody keyboards, VDUs and telecommunications facilities linking staff to extensive distributed computing services, including electronic filing and electronic mail. It may be some years before we are all taken off our diet of ink on paper but in the United States a few corporations are already experimenting. A study *Towards Paperless Information Systems* by F. W. Lancaster (1978; Academic Press; 179 pages; £8·75) examines how such a system might operate—and in fact does operate within the US Central Intelligence Agency.

Those who wish to understand the whole background to the new technology might care to read *The Future with Microelectronics* by Iann Barron and Ray Curnow (1979; Frances Pinter Ltd; £7·95; 243 pages). The research on which the book is based was carried out by the Science Policy Research Unit of Sussex University and was commissioned by the Computers, Systems and Electronics Requirements Board of the Department of Industry. One of the purposes of the study was to encourage constructive discussion so that non-specialists might influence the exploitation of the computer, thus underlining the lesson of many reports: that technology (and, in particular, office technology systems) should be designed for man—and woman—not vice versa.

New CSD Publications

This is a list of the documents recently issued by the Civil Service Department and its associated bodies. It includes material from the Civil Service College and the Civil Service Commission, as well as from CSD itself.

These items may be examined in the Central Management Library, Civil Service Department, Old Admiralty Building, Whitehall, London SW1 2AZ.

Unless otherwise stated, requests for copies should be sent to the Central Management Library, CSD, at the above address. HMSO publications may be ordered from PO Box 569, London SE1 9NH; from Government Bookshops, or through any bookseller.

Changes in the Machinery of Government in Britain: sources of information
2 pages; Central Management Library bibliography series, B24; gratis.

Civil Service Pay Research. The 1979 Review of the Adjustment for Differences in Superannuation Benefits. Report by the Government Actuary
34 pages; HMSO; £0·90; ISBN 0 11 630417 0.

Guide for New Managers
34 pages; HMSO; £0·95; ISBN 0 11 630346 8.
(Previously issued as a CSD departmental publication in 1975)

Home Civil Service: Senior Staff Movements
2 pages; published monthly; gratis.

Interchange of Staff between the Home Civil Service and Industry: Report for 1978
9 pages; gratis; ISSN 0143-2001.

Notes for the Guidance of Secretaries of Royal Commissions, Temporary Commissions and Committees 1979 reissue
14 pages; looseleaf; gratis.

Office of Parliamentary Counsel: a bibliography
2 pages; Central Management Library bibliography series, B26; gratis.

Published by CSD 1968–1978: a Subject Guide to the Literature issued by the Civil Service Department
27 pages; revised annually; gratis; ISSN 0308-0803.

Report of the Civil Service Pay Research Unit Board and the Civil Service Pay Research Unit 1979
72 pages; HMSO; £1·75; ISBN 0 11 630418 9.

Senior Professional Administrative Training Scheme: Survey of Successful Candidates, by J. Walker
34 pages; £0·75; ISBN 0 7115 0000 2.

Your Move? Guide to the Dispersal Programme
42 pages, plus Annex; £1·00.
(Available to government departments from HMSO, Gee Street; code 28-2002)

Central Computer Agency
The following documents are available without charge from: Publications and Information Branch, Central Computer Agency, Riverwalk House, 157–161 Millbank, London SW1P 4RT.

Government Computer Topics
April 1979.

Microcomputers and their Applications, report by R. M. Hodson, consultant.
21 pages.

Word Processing by Computer: Report of a Pilot Project at the Department of Education and Science, Darlington
34 pages.

Civil Service College
The first two publications are available from: The Librarian, Civil Service College, Sunningdale Park, Ascot, Berks, SL5 0QE; the remainder should be ordered from The Secretariat at the same address.

The Crisis in Affirmative Action in the USA, by Gaynor Cohen
15 pages; CSC Working Paper No. 9; gratis.

The Professional Ethic of the Administrator: an address given by Mr. Richard Wilding
12 pages; CSC Working Paper No. 10; gratis.

Advance Information on Courses and Seminars: Autumn Term, September–December 1979
folder; published three times a year; gratis.

Evaluating the Staff Management and Organization Course: an Interim Report, by Prem Mohana and Mellissa Towner
32 pages; gratis.

Systems Training Courses: Programme September 1979–August 1980
61 pages; gratis.

Main Series of Courses and Seminars: Programme September 1979–August 1980
176 pages; gratis.

Eighth Annual Report by the Principal to the Civil Service College Advisory Council
64 pages; gratis.

Civil Service Commission
The following documents are available from: Careers Information Division, Civil Service Commission, Alencon Link, Basingstoke, Hants RG21 1JB.

Annual Report 1978
63 pages; ISSN 0141-0024; gratis.

The Executive Decision: Your Guide to a Career in the Civil Service
16 pages; gratis.

A simple and readily assimilated training package on office safety, which centres around a handbook for Civil Service supervisors and needs no formal instructors or classroom, has been made generally available through Government bookshops, price 50p. 15,000 copies of the package have been sold in the first year.

Letters to the Editor

The views expressed in Letters to the Editor are the writers' own, and not necessarily those of their departments.

Why is implementation so difficult?

Dear Editor,

Mr. Wimberley (Letters, May edition) omits to tell us that the ancient emperors were accountable only to God, i.e. themselves; and that their response to the failure of any agent to perform as they—with hindsight—would have done was: 'Off with his head.'

However, Mr. Wimberley's message is well taken; modern systems of administration exhibit the same degree of diffused confusion as the earlier ones. But, according to some newspapers, one country has recently begun an experiment in which there is both an 'Emperor' and clear-cut objectives. If so, the outcome will be no less interesting to management scientists as to ordinary mortals.

Yours ever,

CYRIL HANCOCK
Civil Service Department

Computer Installations for Government Departments

A list of all Government computers as at 1st January 1979 was published as a supplement to the May 1979 edition. Details of computers ordered during the period 1st January to 31st March 1979 are shown in the following table.

DATE OF ORDER	DEPARTMENT[1]	LOCATION	MAIN USES	MANUFACTURER[2] AND TYPE OF COMPUTER
1B Computers on order for administrative and general purposes				
January 1979	DHSS	North Fylde	NHS superannuation and statistics	ICL 1904S
January 1979	Home Office	London	Pay and statistics	ICL 1904S
January 1979	CSD	Norwich	Bureau machine	ICL 2960
February 1979	DHSS	North Fylde	Social security payments	ICL 1904A
March 1979	Customs and Excise	London	Operational research	NORD 1226
March 1979	Industry	Teddington	General ADP	ICL 2972
March 1979	National Savings	Glasgow	National savings	2 × ICL 2972
March 1979	National Savings	Lytham St. Annes	Bonds and stocks	ICL 2976
March 1979	HMSO	London	Distribution of publications	HP 3000 Series III
March 1979	Environment	Hastings	Payroll, accounting and supplies	2 × ICL 2960
2B Computers on order for scientific and technical purposes				
January 1979	Industry	Stevenage	Scientific calculations	HP minicomputer
January 1979	Defence (PE)	Bedford	Simulation of realistic field force characteristics	HIS Level 6 Model 43
January 1979	Defence (PE)	Chertsey	Graphics design work	Imlac PDS-4-8 and PDS-4
February 1979	Home Office	London	Scientific applications	DEC PDP 11/34

[1], [2] Refer to supplement to May edition for Department and Manufacturer keys. Abbreviation for the following manufacturer is included for the first time: NORD—Richard Norton (NORD) Limited.

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